AD-A201 590

THE EFFECTS OF QUALITY CIRCLES
ON EMPLOYEE ATTITUDES IN A
DEPARTMENT OF DEFENSE ORGANIZATION

THESIS

Lee L. Shaw
Major, USAF

AFIT/GLM/LSR/88S-65

DEPARTMENT OF THE AIR FORCE

AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

88 12 21 047

AFIT/GLM/LSR/88S-65

THE EFFECTS OF QUALITY CIRCLES
ON EMPLOYEE ATTITUDES IN A
DEPARTMENT OF DEFENSE ORGANIZATION

THESIS

Lee L. Shaw
Major, USAF

AFIT/GLM/LSR/88S-65

DTIC
ELECTE
DEC 2 1 1988
S   D
H

Approved for public release; distribution unlimited

THE EFFECTS OF QUALITY CIRCLES ON EMPLOYEE ATTITUDES

IN A DEPARTMENT OF DEFENSE ORGANIZATION

THESIS

Presented to the Faculty of the School of Systems

and Logistics of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Logistics Management

Lee L. Shaw

Major, USAF

September 1988

Acknowledgements

I would like to thank Dr. Robert P. Steel for the assistance and guidance he provided to me. I am also indebted to Dr. Steel for the use of his data base without which this project would not have been possible. In addition, I would like to thank Captain Terry Kline for the assistance he provided in preparing the data base for analysis. Finally, I wish to thank my wife Chong for her patience and understanding during the time I was working on this project.

Lee L. Shaw

Accession For		
NTIS GRA&I	☑	
DTIC TAB	☐	
Unannounced	☐	
Justification		
By		
Distribution/		
Availability Codes		
Dist	Avail and/or Special	
A-1		

Table of Contents

List of Tables

Abstract

Quality circles are a form of participative decision making in which a group of employees identifies and provides solutions to problems in the organization. Imported from Japan in the early 1970s, quality circles are being used in increasing numbers. The Department of Defense has also used quality circles in some of its organizations.

Previous studies on quality circles have found that participation in the circles has a positive effect on employee attitudes. This study examined the effects of participation in quality circles on job satisfaction, retention, participation in decision making, and job feedback.

The data for this study were derived from two administrations of a quality of work life survey to a Department of Defense organization. The surveys were administered 18 months apart. A sample was derived that consisted of those respondents who had participated in both administrations of the surveys. This sample was then divided into two criterion groups, a comparison group and a QC group. *these. Minima*

An analysis of the data did not support the hypotheses that participation in quality circles has a positive effect on employee attitudes. Limitations in the design of the study and a lack of management support were identified as

possible causes. Another possible cause for the lack of success of the quality circle program in changing employee attitudes was that the novelty of the program may have already worn off by the time this study was begun. The people involved with the program may have lost interest in it.

THE EFFECTS OF QUALITY CIRCLES ON EMPLOYEE ATTITUDES IN A DEPARTMENT OF DEFENSE ORGANIZATION

I. Introduction

General Issue

A quality circle is a form of participative decision making group that was imported from Japan in 1974. Small groups of employees, usually less than ten, are trained in the areas of data collection and problem solving. The group meets weekly for about an hour to identify quality related problems and to propose solutions to the problems.

Quality circles are being used in the United States in increasing numbers. The Department of Defense has initiated quality circle programs in both its military and civilian sectors. Quality circle programs are expensive to begin and also to maintain but their expected benefits should overcome the costs. The Department of Defense needs to know if the initiation of quality circles has been beneficial.

Specific Problem

Quality circles should bring about improvements in three main areas (Ross & Ross, 1982). The first area is in the quality of the product produced or the service rendered by the organization. The second area of improvement is the productivity of the organization. The third area is the

1

attitudes of the individual employees. This study will look at the effects of quality circle participation only on the attitudes of the employees. Specifically, to what extent does participation in a quality circle improve an employee's attitude toward the job and the organization?

Hypotheses

The attitudes looked at in this study are job satisfaction, intentions to remain with the organization, the feeling of having a voice in the decision making process of the organization, and the perception of receiving job feedback from one's supervisor. The hypotheses are:

1. Participation in a quality circle should increase a group member's job satisfaction.

2. Participation in a quality circle should have a positive effect on the employee's intentions to remain with the organization.

3. Participation in a quality circle is predicted to increase the employee's feeling that he/she has a voice in the decision making process in the organization.

4. Participation in a quality circle is predicted to improve an employee's perception of the job feedback he/she receives.

Background

Quality circles are small groups of employees who meet periodically to identify and solve problems related to production and to the quality of products or services. The

2

circles usually consist of 10 or fewer workers and are led
by a supervisor or a senior employee (Ross & Ross, 1982).
Ross and Ross (1982) state the "participants are taught
elementary techniques of problem solving, as well as various
measurement techniques and quality strategies, including
cause-and-effect diagrams, pareto charts, histograms, and
various types of graphs" (p. 6). Although groups of
employees participate in developing solutions to problems,
quality circles are regarded as a consultative
decision-making process as opposed to a participative
decision-making process because the quality circle can not
implement its solutions without the approval of management
(Steel & Shane, 1986). "This process is designed to tap
latent potential for creative problem solving within an
organization's work force" (Steel & Shane, 1986, p. 450).

Japanese origin. Quality circles originated in Japan
and were later brought to the United States. However, the
Japanese had learned of the techniques of statistical
quality control from American consultants. In the 1950s,
experts on statistical quality control from the United
States helped the Japanese develop training programs on
quality control. "J. M. Juran and W. Edwards Deming are the
experts credited with teaching the Japanese quality
practices and methodologies" (Barra, 1983, p. 11). Dr.
Deming, a government statistician, taught the Japanese the
principles of statistical quality control (Ross & Ross,
1982). Dr. Juran taught the Japanese the concept of Total

3

Quality Control that states "quality begins in the design stage and ends after satisfactory services are provided to the customer" (Ingle, 1982, p. 8). While Dr. Juran advocated teaching quality control to middle management, the Japanese extended this concept to include teaching quality control to all members in the organization (Ross & Ross, 1982). The Japanese began putting these ideas into practice and in 1960, the first quality circles were developed (Ross & Ross, 1982). The term quality circle came about because the members of the first groups sat in a circle during their training (Gryna, 1981).

U.S. origin. As the quality of Japanese products began to improve, American companies began to take notice of the quality control techniques being employed by the Japanese. In 1973, the Lockheed Company sent some of its people to Japan to learn about quality circles. In October 1974, Lockheed started the first quality circles in the United States patterned after Japanese quality circles (Ross & Ross, 1982).

Benefits of quality circles. Quality circles, if run correctly, may bring about certain benefits to the organization. Some of these benefits, as rank ordered by 24 companies who use quality circles, are "improved communications, job satisfaction, improved morale, productivity improvement, quality improvement, cost savings, development of people, team building, respect between workers and management, development of future leaders,

4

supervisory growth, and getting commitment to the company"
(Ross & Ross, 1982, p. 19). While the monetary benefits of
quality circles are significant, Gryna (1981) believes "that
the most important benefit of circles is their effect on
people's attitudes and behavior" (p. 20). Alexander (1981)
also agrees with Gryna. He states that "the development of
employees at all levels is the first and most important
priority of the Quality Circles program" (p. 616).

Literature Review

Since quality circles are relatively new in the United
States, sufficient research is not available to undeniably
support or refute the contention that quality circles affect
their member's attitudes in a positive manner. Many of the
studies that have been accomplished were flawed to some
extent in their design (Steel & Shane, 1986). Overall, the
conclusions of researchers regarding the effects on employee
attitudes of participation in quality circles are mixed.
Researchers have found in some cases that quality circles do
have a positive impact on employee attitudes, whereas other
studies have shown that quality circles do not affect
employee attitudes. The common element in both cases is
that the efficacy of the quality circle process is dependent
on how well the quality circles are implemented and run and
how successful the group is in getting management to accept
their solutions.

Design flaws. The majority of the flaws in the designs of the research studies were beyond the control of the researchers. One common limitation was in the small size of the samples. Usually, researchers had to settle for what was available and could not increase the sample size. Harper and Jordan (1982), Steel and Lloyd (in press), and Steel, Ovalle, and Lloyd (1982) recognized that their studies were limited by a small sample size. This constraint affects the reliability of the findings and the generalizability of results.

Another common limitation was the high rate of subject mortality within some of the studies. In particular, those studies involving military personnel (Mento, Steel, Shane, & Lloyd, 1984; Steel & Lloyd, in press; Steel et al. 1982) were subject to high rates of employee turnover or separation. Such disruption in the quality circle membership poses problems for longitudinal studies because the newly assigned members have not participated in the pretest survey (Steel & Shane, 1986). Additionally, maturation of the quality circle will proceed more slowly if the group's composition is constantly changing. This change in the quality circle membership may detract from the cohesiveness of the group and have detrimental effects on the employees' attitudes (Griffin & Wayne, 1984).

The results of several studies have been limited in usefulness because of the short time span of the study. Programs such as quality circles that impact employee

6

development may require more time to reach fruition than is generally allowed in these studies (Steel & Shane, 1986). Short time-horizon studies include Hunt (1981), Harper and Jordan (1982), Steel et al. (1982), and the hospital study in Steel, Mento, Dilla, Ovalle, and Lloyd (1985).

The choice of a cross-sectional design also limits the effectiveness of a study. With such a design, it is not possible to conclude that the differences between quality circle groups and control groups were caused by the quality circle intervention (Steel & Shane, 1986). Other factors may cause apparent differences between the two groups. Griffin and Wayne (1984) and Rafaeli (1985) employed cross-sectional designs in their studies.

Some limitations on previous research efforts were entirely out of the researcher's control. For example, Novelli and Mohrman (1982) had initially set up a control group for their study. However, after the quality circle program had been implemented, the work facilities of the control group were expanded causing a deterioration in working conditions. The resultant drop in morale negated the usefulness of the control group (Novelli & Mohrman, 1982). Similarly, Marks, Mirvis, Hackett, and Grady (1986) caution that their results may have been affected by a major change in the structure of the organization and poor economic times existing during the course of their study.

Positive effects. Some researchers have found that the effects of quality circles on employee attitudes were

positive. Hunt (1981), in a study of quality circles at General Dynamics Corporation, found significant improvements in some of the criteria used to measure employee morale. Hunt (1981) concluded that improved morale is a realistic outcome of quality circle programs.

Tortorich, Thompson, Orfan, Layfield, Dreyfus, and Kelly (1981) also found that quality circles improved employee attitudes. In a study at Martin Marietta Aerospace, Tortorich et al. (1981) found that participation in quality circles had a marked effect on such criteria as employee attitudes towards their jobs, their supervisors, and their co-workers.

In a study of four companies, Harper and Jordan (1982) found positive changes in job satisfaction, cooperation, communication with management, and personal influence. A significant finding of the Harper and Jordan (1982) study was that quality circles may be effective in a unionized organization.

Jenkins and Shimada (1983) studied a quality circle program in an electronics company. They found that quality circle participants scored higher than non-participants in the areas of skill variety, autonomy, and feedback. These dimensions were interpreted as indicators of employee morale (Jenkins & Shimada, 1983).

Steel et al. (1985) studied two quality circle programs in the U.S. Army. One of the organizations was a maintenance facility. Steel et al. (1985) found that

quality circles had a positive effect on job satisfaction in the maintenance facility.

Nonsignificant effects. A second organization studied by Steel et al. (1985) was a medical facility. In this organization, however, the results were different. Steel et al. (1985) found that there were no significant effects on employee attitudes as a result of participation in quality circles.

Other researchers have also concluded that quality circles had no significant effects on members' attitudes. Novelli and Mohrman (1982) studied a quality circle program at a food distribution warehouse. They found that anticipated increases in employee morale did not materialize.

Steel et al. (1982) studied six quality circles in the Department of Defense. They concluded that the quality circle program had little impact on employees' attitudes.

In another study of quality circles at naval installations, Atwater and Sander (1984) found that quality circle participation had no effect on the job attitudes of the quality circle members.

Mento et al. (1984) also studied quality circle programs at two military installations. Their conclusions were that quality circle participation did not lead to any significant change in five variables that were used to measure work-related attitudes.

Rafaeli (1985) studied quality circles in a large electronics company. The results indicated that job

satisfaction was not affected by the quality circle program (Rafaeli, 1985). He concludes that, "these results should serve as a warning against blind acceptance of undocumented claims that quality circles always improve employee morale" (Rafaeli, 1985, p. 612).

Marginal effects. Two other studies found that quality circles have small or marginal effects on employee morale (Steel & Lloyd, in press; Marks et al., 1986). Steel and Lloyd (in press), in a study of quality circles in the Department of Defense, found evidence of marginal support for the quality circle process. In Marks et al.'s (1986) study, the quality circle members did not show any increase in quality of work life measures. However, the control group displayed a decline in these same measures during the study. Marks et al. (1986) concluded that quality circles appear "to have done more to provide informational and emotional social support to buffer against potential threats to work life quality than to directly enhance employees' perceptions of their jobs and work situation" (p. 69).

Effects of successful quality circles. The success of a quality circle may be a significant factor in determining whether the circle will have a positive effect on employee attitudes. Steel et al. (1985), in a study of two U.S. Army organizations, found that the quality circle program in one organization was more successful than the quality circle program in the other organization. Success of the quality circles was measured by their effectiveness in generating

solutions to problems (Steel et al., 1985). Consequently, they found that the successful quality circle program had a positive effect on the members' attitudes whereas the less successful quality circle program showed no significant change in the members' attitudes (Steel et al., 1985). The researchers concluded that if a quality circle program is set up and administered properly, the results should be positive. An incorrectly run program, on the other hand, may bring about negative results (Steel et al., 1985).

Atwater and Sander (1984), in their study of quality circles in the U.S. Navy, came to a similar conclusion. They state that "the way quality circles are implemented and administered is critical" (Atwater & Sander, 1984, p. ix) if they are to have a positive *effect* on the employees' attitudes.

Griffin and Wayne (1984) also reached the same conclusion. They studied quality circles in nine plants of a large manufacturing company. Success of the circles was measured by the number of improvements suggested and the number of improvements adopted (Griffin & Wayne, 1984). They concluded that the more effective quality circles had higher levels of job satisfaction, intrinsic satisfaction, self-esteem, cohesion, and co-worker satisfaction (Griffin & Wayne, 1984).

Requirements for successful quality circles. The reason that some of the quality circles described in the previous studies were not very successful may have been

11

because one or more of the requirements of quality circles were violated (Alexander, 1981). Alexander (1981) lists these requirements as a commitment to people building, trust, commitment to quality, open communication, supportive management, patience, training and development, a focus on results, supportive policies and procedures, and shared responsibilities. A lack of management support was cited most often as a cause for the lack of success in quality circle programs (Atwater & Sander, 1984; Mento et al., 1984; Novelli & Mohrman, 1982; Steel et al., 1985).

Conclusion. The literature on quality circles indicates that positive benefits may be derived from circle programs. However, these benefits do not come automatically with the initiation of these programs. Most importantly, both management and circle members must be committed to the success of the quality circle. A quality circle program that has a high level of support from management and circle members and meets the remaining requirements described by Alexander (1981) should achieve the four benefits listed as hypotheses for this study. The hypotheses are that job satisfaction should increase, intentions to remain with the organization should improve, the feeling of participating in decision making should increase, and the perception of job feedback should improve.

II. Method

Sample

The participants in this study were employees of a Department of Defense Organization. The sample of 565 employees consisted of 3 military members and 562 civilians. There were 288 males and 277 females. The mean age of the participants was between 31 and 40 years old, the mean educational level was "some college work", and the mean tenure of the participants with this organization was "3-4 years".

Measures

The questionnaire was a broad based survey of employee attitudes. Only portions of the survey were used in this study. The measures used from this questionnaire included demographic items, job satisfaction items, intention to remain, participation in decision making, and job feedback. In addition, several items were embedded in the survey specifically dealing with reactions to quality circles.

The reliabilities for the measures used in this study were calculated using Cronbach's coefficient alpha. Table 1 lists the reliability coefficients for job satisfaction, participation in decision making, and job feedback. The coefficients range in size from .80 for extrinsic satisfaction to .93 for job feedback. These values from the

Table 1
Reliabilities (Cronbach's Alphas)
for Four Survey Instruments

	Pretest		Posttest	
Variable	N	Cronbach's Alpha	N	Cronbach's Alpha
Job Satisfaction				
Intrinsic	446	.87	521	.89
Extrinsic	446	.80	521	.80
Job Feedback	528	.91	534	.93
Participation In Decision Making	545	.85	549	.87

reliability analysis indicate that the measures used in this study were reasonably reliable measures.

Demographics. Six items in the survey pertained to demographic characteristics of the respondent population. These variables were age, educational level, sex, length of time in the organization, government service classification, and pay grade level. The response options for age were: less than 20 (1), 20 to 25 (2), 26 to 30 (3), 31 to 40 (4), 41 to 50 (5), 51 to 60 (6), and more than 60 (7). The response options for educational level ranged from non high school graduate (1) to doctoral degree (8). Sex was coded as either male (1) or female (2). Length of time in the organization consisted of a scale with unequal intervals

14

ranging from less than one year (1) to more than 20 years (8). The options for government service classification were officer (1), enlisted (2), civilian GS (3), civilian WG (4), non-appropriated fund employee (5), and other (6). Pay grade level had these responses: 1-2 (1), 3-4 (2), 5-6 (3), 7-8 (4), 9-10 (5), 11-12 (6), 13-15 (7), and senior executive service (8). Appendix A lists the six demographic items and their response scales.

Job satisfaction. The 18 items used to measure job satisfaction were derived from the short form of the Minnesota Satisfaction Questionnaire (MSQ) developed by Weiss, Dawis, England, and Lofquist (1967). There are five responses for each of the 18 items in the measure which range from very dissatisfied (1) to very satisfied (5). Intrinsic satisfaction was measured by twelve items and extrinsic satisfaction was measured by six items. The responses to the intrinsic and extrinsic item sets were summed to obtain two cumulative measures of intrinsic and extrinsic job satisfaction facets. Weiss et al. (1967) stated that the results of construct validity studies "indicated that the MSQ measured satisfaction in accordance with expectations from the Theory of Work Adjustment" (p. 18). The Theory of Work Adjustment is a conceptual framework for research developed by the Minnesota Studies in Vocational Rehabilitation (Weiss et al., 1967). Samples of intrinsic items include the statements "being able to keep busy all the time" and "the chance to work alone on the

15

job". Samples of extrinsic items are "the way my boss handles his or her people" and "the competence of my supervisor in making decisions".

The reliability of a measure refers to its ability to provide consistent results (Emory, 1985). Weiss et al. (1967) reported median reliability coefficients of .86 for intrinsic satisfaction and .80 for extrinsic satisfaction. Griffin and Wayne (1984) reported a reliability for the MSQ of .86 for the intrinsic items and .88 for the extrinsic items. Mento et al. (1984) used 15 of the items from the MSQ and reported a reliability of .85. Appendix E lists the 18 items and their responses. In the appendix, the items that measure intrinsic satisfaction are followed by an (I) and the extrinsic items are followed by an (E).

Intent to remain. Fishbein and Ajzen (1975) state that "the best single predictor of an individual's behavior will be a measure of his intention to perform that behavior" (p. 369). Mobley (1977) proposed a model in which the decision to quit or stay with an organization was immediately preceded by the intention to quit or stay. Steel and Ovalle (1984), in a meta-analysis of 33 studies, found support for Mobley's model. They reported a positive mean correlation between intention to quit and employee turnover of $r = .50$.

To determine a respondent's employment intentions, the questionnaire contained one item which asked whether the employee intended to remain in federal service. The five choices ranged from I definitely intend to remain in federal

16

service (1) to I definitely intend to leave federal service (5). Appendix B lists this item and its choices.

Participation in decision making. Five items were used to measure participation in decision making. These five items defined participation in decision making in terms "of employee perceptions of the degree of influence they possessed over decisions that affected them or their work" (Steel & Mento, 1987, p. 411). Sample items were "within my work-group the people most affected by decisions frequently participate in making the decisions" and "in my work-group there is a great deal of opportunity to be involved in resolving problems which affect the group". The responses ranged from strongly disagree (1) to strongly agree (7). The responses to the five items were summed to obtain a composite score. Steel and Mento (1987), in a study of six military organizations, reported reliability coefficients for this measure of .85, .87, .85, .87, .85, and .90. Steel et al. (1985) used this measure in studying two organizations and reported reliabilities of .74 and .84. Appendix C lists these five items and their response alternatives.

Job feedback. Five items concerning job feedback were used in this survey. A sample item asked "to what extent do you find out how well you are doing on the job as you are working?". The five responses to these items ranged from very little (1) to very much (5). This feedback measure was adapted from the Job Characteristics Inventory (Sims,

17

Szilagyi, & Keller, 1976). The responses to the five items were summed for purposes of statistical analysis. Sims et al. (1976) reported a reliability coefficient of .80 for these five items. Steel et al. (1985) reported reliabilities of .86 and .91 in their study of two organizations. Appendix D lists these five items and their response choices.

Attitudes toward quality circles. There were 10 items on the survey that queried the respondents specifically about the organization's quality circle program. Two items asked if the employee was a member of a quality circle and if so, for how long. The responses to the first item were I was never a quality circle member (1), I was but am no longer a member (2), and I am a member now (3). An item dealing with the length of involvement with quality circles provided the responses: Less than 1 month (1), 1-2 months (2), 3-6 months (3), 7-12 months (4), 13-18 months (5), 19-24 months (6), and more than 2 years (7).

The remaining items pertained to the employees' perceptions about the effectiveness of the quality circles and how well the circles were supported by management. One item stated, "In general, the organization's Quality Circles have been effective in getting positive changes to be made". Responses ranged from not ever effective (1) to almost always effective (5). Another item asked, "To what degree has your own work benefitted from ideas and suggestions made by the Quality Circle in your work group?"

18

The response choices ranged from not at all (1) to very often (5). For the item, "Have the suggestions for change developed by your Circle been implemented," the response alternatives ranged from never (1) to all the time (4). QC effectiveness was measured with an item which asked, "How effective was the Quality Circle in developing solutions to problems?" The response continuum for this item ranged from not effective at all (1) to very effective (3). The final item dealing with the effectiveness of the quality circles asked, "How satisfied are you with the Circle process in your organization?" The responses ranged from very dissatisfied (1) to very satisfied (5).

There were three items pertaining to management's support of quality circles. The first item stated, "The organization's Quality Circles have received unfair preferential treatment from management". The second item stated, "Management has supported the Quality Circle program". The response choices available for both items were scaled from strongly disagree (1) to strongly agree (5). An additional item asked, "Do the managers and supervisors in your organization support the Quality Circle process?" The response choices to this item were not at all (1), sometimes (2), very much (3), and I don't know (4). Appendix F lists each of these quality circle items.

The responses to these items were used to determine if problems existed in the way the quality circles in this organization had been administered. If the responses

19

indicated that there were problems with organizational support/administration of the circles, such evidence may bear on conclusions drawn from the evaluative data.

Procedure

The data for this study were derived from two administrations of an employee quality of work life survey. The surveys were administered to employees of a Department of Defense Organization. The surveys were administered 18 months apart.

The pretest survey was administered during April, 1986 to 1500 employees. The posttest survey was administered during October, 1987 to 1300 employees. Both surveys were administered in the organization's auditorium to groups ranging in size from 50 to 120 people. Employees were advised that participation was voluntary and that no adverse action would be taken against anyone who did not participate. The employees were advised that their responses would remain confidential. The purpose of the survey was briefed as an organizational environment assessment commissioned by the management of the organization. Social security numbers were collected from the individuals as they left the auditorium. The numbers were recorded on a separate list with matching answer sheet identification numbers. Using the social security numbers, the pretest and posttest results for individual respondents were matched. This process yielded a sample of 565

20

employees who had participated in both administrations of the survey.

To create the two criterion groups, two items dealing with circle membership and length of association with a circle were used. The responses to these two items were used to split the sample into a quality circle group and a comparison group. The comparison group consisted of those employees who indicated on both the pretest and posttest that they were never a member of a quality circle (1). The QC group consisted of those employees who indicated on the posttest that they were currently (3) or had previously been (2) a member of a quality circle and who indicated on the pretest that they were not a member of a quality circle (1) at that time. Additionally, only those employees who indicated on the posttest that they had been a quality circle member for three months or more were retained in the QC group for purposes of the analysis. This screening process was designed to limit QC group membership to those employees who joined a quality circle after the pretest and were members for at least three months. This resulted in a QC group consisting of 61 respondents and a comparison group consisting of 313 respondents.

III. Results

Demographic Statistics

The comparison group and the QC group were compared on four demographic items using t-tests. Table 2 shows the results of these comparisons on the pretest. The four items were age, education, tenure, and pay grade. There were no significant differences between the two groups on the item dealing with educational level. There were significant differences on the other three items. Mean age was significantly higher for the comparison group than the mean age of the QC group. A similar difference was found between the groups on tenure. The comparison group had significantly more time with the organization than employees in the QC group. Furthermore, employees in the comparison group occupied a significantly higher average pay grade than did employees in the QC group.

Table 3 shows the results of t-tests between the two groups on the posttest. In this case there were no significant differences on educational level and pay grade. Differences were still evident on age and tenure. These differences mirrored those on the pretest. The comparison group was significantly older and had more time with the organization than did the employees affiliated with quality circles.

Comparisons between the two criterion groups indicated that the groups were not strictly equivalent. Differences

22

Table 2
T-Test Comparing QC and Comparison Groups
on Selected Pretest Demographic Variables

Variable	Comparison Group		QC Group		t
	M	SD	M	SD	
Age	4.61	1.39	3.92	1.46	3.51 *
Educational Level	3.68	1.61	3.98	1.66	1.33
Tenure	3.91	2.46	3.21	2.09	2.06 *
Pay Grade	4.30	1.53	3.80	1.61	2.29 *

*p < .05

Table 3
T-Test Comparing QC and Comparison Groups
on Selected Posttest Demographic Variables

Variable	Comparison Group		QC Group		t
	M	SD	M	SD	
Age	4.73	1.34	4.05	1.47	3.55 *
Educational Level	3.74	1.61	3.95	1.69	0.94
Tenure	4.52	2.13	3.83	1.76	2.34 *
Pay Grade	4.57	1.46	4.28	1.54	1.39

*p < .05

in age and time with the organization existed between the groups. Initially, a difference existed in pay grade on the pretest. On the posttest, the direction of mean pay grade difference still favored the comparison group, but the difference was no longer significant. Differences between the comparison group and the QC group in terms of group composition factors may serve to detract from the study's ability to attribute treatment group differences to the quality circles.

Evaluation Results

Table 4 gives the means and standard deviations for both the comparison group and the QC group on five variables. The numbers (in parentheses) designate the type of t-test comparison (i.e., between groups or times). Table 4 provides t-statistics comparing mean differences between the two groups and within a treatment condition across survey administrations.

Between group differences. The comparison and QC groups were compared on both the pretest and the posttest. The t statistics summarizing differences between the means on five variables are given in Table 4.

The two facets of job satisfaction examined in this study, intrinsic satisfaction and extrinsic satisfaction, were compared for both the QC group and the comparison group on the pretest. There were no significant differences in levels of job satisfaction favoring the utility of the QC

24

Table 4
T-Test Between the Comparison Group and the QC Group

Variable	Comparison Group				QC Group				t(1-2)	t(3-4)	t(1-3)	t(2-4)
	Pretest(1) M	SD	Posttest(2) M	SD	Pretest(3) M	SD	Posttest(4) M	SD				
Feedback	14.58	5.06	14.35	5.41	14.16	5.10	12.97	4.77	1.05	1.28	0.58	1.85
Part. in Decision Making	20.45	8.38	19.27	8.60	17.75	8.13	17.92	7.81	2.29 *	0.15	2.30 *	1.13
Intent To Remain	1.75	1.04	2.01	1.30	1.75	1.00	2.25	1.35	3.42 *	3.63 *	0.01	1.33
Intrinsic Sat.	44.12	8.58	43.68	8.96	42.20	8.45	42.61	9.14	1.52	0.63	1.44	0.82
Extrinsic Sat.	18.12	5.15	17.13	5.53	16.60	5.97	15.52	5.49	3.32 *	1.05	1.95	2.07 *

*p < .05

25

treatment. The two groups were roughly equivalent on both measures of job satisfaction at the time of the pretest. There were no significant differences on intrinsic satisfaction at the posttest. However, there was a significant difference between the groups on extrinsic satisfaction. Contrary to Hypothesis 1, the comparison group reported a higher level of extrinsic satisfaction than the QC group.

There were no significant differences in intent to remain between the groups on either the pretest or the posttest.

There was a significant difference between the two groups on the pretest measure of participation in decision making. The comparison group had significantly higher scores on participation in decision making at the pretest. This difference was not statistically significant when posttest results were analyzed.

Table 4 shows the results of the comparison between the two groups on job feedback. There were no significant differences between groups on this measure.

Within group comparisons over time. Score changes over time were analyzed for each criterion group. The results of these analyses are also given in Table 4.

The QC group showed no significant difference between the pretest and the posttest on either intrinsic or extrinsic satisfaction. The comparison group showed no change on intrinsic satisfaction but did display a

26

significant change on extrinsic satisfaction. Mean

extrinsic satisfaction for the comparison group was

significantly lower on the posttest.

Significant change from the pretest to the posttest was

demonstrated by both groups on the intent to remain

measure. Both the QC group and the comparison group showed

a significant increase in intentions to quit over time.

The QC group showed no significant change on

participation in decision making over time. However, Table

4 also shows that the comparison group did manifest a

significant score change on this variable over the same time

period. On the posttest, the comparison group reported less

influence in decision making than they had at the time of

the pretest.

Employees' perceptions of job feedback did not change

for either the QC group or the comparison group over the

course of the study.

Views about the quality circles program. Four

supplemental items on the posttest were directed to QC group

members only. Frequencies for these items are shown in

Table 5. For the item addressing supervisory support, 6.7%

of the responses were "not at all". The majority of

responses, 50.0%, selected the descriptor, "sometimes". The

item dealing with implementation of suggestions produced

21.1% "never" responses and 45.6% "some of the time"

responses. On the effectiveness of the QCs in developing

solutions, 17.2% of the responses were "not effective",

27

Table 5
Frequencies of Responses of the QC
Group on Posttest QC Attitudes

Item	Responses	Freq	Percent	M	SD
Supervisory	1. Not at all	4	6.7	2.45	0.75
Support	2. Sometimes	30	50.0		
	3. Very much	21	35.0		
	4. I don't know	5	8.3		
Suggestions	1. Never	12	21.1	2.16	0.80
Implemented	2. Some of the time	26	45.6		
	3. Most of the time	17	29.8		
	4. All of the time	2	3.5		
Developing	1. Not effective	10	17.2	2.16	0.70
Solutions	2. Somewhat effective	29	50.0		
	3. Very effective	19	32.8		
Satisfied	1. Very dissatisfied	6	10.3	3.16	1.14
With the	2. Dissatisfied	10	17.2		
QCs	3. Can't decide	16	27.6		
	4. Satisfied	21	36.2		
	5. Very Satisfied	5	8.6		

50.0% of the responses were "somewhat effective", and 32.8% of the responses were "very effective". The item on satisfaction of employees with the quality circle process yielded 44.8% of the responses being "satisfied" or "very satisfied". About 27.6% of the responses were "can't decide", and 27.5% of the respondents selected either "dissatisfied" or "very dissatisfied".

Table 6 shows between group comparisons for the pretest on several additional items dealing with QC members' views of the QC process. There were no significant differences between the means for the two groups on any of the items.

Table 6
T-Test Between Groups on QC Attitudes on the Pretest

	Comparison Group		QC Group		
Item	M	SD	M	SD	t
Getting Changes Made	2.91	0.95	3.09	0.86	1.31
Own Work Benefitted	2.00	1.05	2.39	1.20	1.90
Unfair Preferential Treatment	2.88	1.06	2.81	1.11	0.45
Management Support	3.61	1.11	3.56	1.16	0.30

Note. $180 \leq df \geq 351$
*$p < .05$

A similar comparison on the posttest is shown in Table 7. Two of the four items yielded significant differences on these analyses. The two items dealt with the effectiveness of the circles and personal benefits from QC ideas and suggestions. The QC group means were significantly higher on both items.

Table 8 provides mean difference tests over time for the comparison group on these items. Of the four items, one item displayed a significant difference over time. The comparison group reported a significantly greater degree of personal benefit for their work from QC activities as the study progressed.

Table 7
T-Test Between Groups on QC Attitudes on the Posttest

Item	Comparison Group		QC Group		
	M	SD	M	SD	t
Getting Changes Made	2.89	0.92	3.51	1.11	4.60 *
Own Work Benefitted	2.22	1.10	3.10	1.50	4.81 *
Unfair Preferential Treatment	2.95	1.05	2.72	1.23	1.48
Management Support	3.67	1.18	3.36	1.40	1.82

Note. 223 ≤ df ≥ 359
*p < .05

Table 8
T-Test Within the Comparison Group on QC Attitudes

Item	Pretest		Posttest		
	M	SD	M	SD	t
Getting Changes Made	2.90	0.95	2.86	0.91	0.69
Own Work Benefitted	1.95	1.02	2.21	1.08	2.31 *
Unfair Preferential Treatment	2.89	1.06	2.97	1.05	1.09
Management Support	3.61	1.13	3.66	1.19	0.61

Note. 101 ≤ df ≥ 286
*p < .05

30

Table 9 shows the same comparisons over time for the QC group. There were significant differences on two of the items. There were significant gains demonstrated by the QC group on the measures of QC effectiveness and personal benefit from QC activity.

Table 9
T-Test Within the QC Group on QC Attitudes

| Item | Pretest | | Posttest | | |
	M	SD	M	SD	t
Getting Changes Made	3.09	0.86	3.52	1.09	2.70 *
Own Work Benefitted	2.39	1.20	3.21	1.47	3.35 *
Unfair Preferential Treatment	2.81	1.11	2.70	1.22	0.53
Management Support	3.56	1.16	3.44	1.42	0.52

Note. $32 \leq df \geq 53$
*$p < .05$

IV. Discussion

Summary of Findings

Job satisfaction. While the quality circle intervention appears to have had no positive effect, the fact that the comparison group had a decline in extrinsic satisfaction suggests that some other factor may have influenced the employees of this organization with respect to job satisfaction levels. The results of this analysis did not support Hypothesis 1 which predicted that participation in a quality circle would increase an employee's job satisfaction.

Intent to remain. Since both groups displayed a decline in their intent to remain with the organization, it is unlikely that participation in quality circles influenced the changes in employment intentions. The results of the posttest show that the quality circle intervention did not produce a positive effect on the employee's intent to remain with this organization. These results do not support Hypothesis 2.

Participation in decision making. Since the comparison group changed on this variable, it appears that other factors besides the quality circle intervention may have influenced responses on the measure of participation in decision making. The quality circle program did not increase QC members' perceptions of participation in decision making, and Hypothesis 3 was not supported.

32

Job feedback. Since employee perceptions of job
feedback did not change for either the QC group or the
comparison group, Hypothesis 4 was not supported.

Attitudes toward quality circles. These items, which
were directed to QC group members only, indicated that a
minority of the participants felt that the quality circles
had not received adequate supervisory support, that the
suggestions of the quality circles had not been implemented,
and that the quality circles had not been effective in
developing solutions. The majority of the participants had
some degree of positive reactions on each of these
QC-program support issues. However, on an item dealing with
satisfaction with the quality circles, the majority of
responses, 55.1%, were either undecided or negative.

Several quality circle items were answered by both
groups. Items addressing the ability of the QCs to get
changes made and the benefits accruing from QC activity
showed significant increases for the QC group relative to
the comparison group. Two other items dealing with
perceptions of unfair preferential treatment and management
support of the QCs showed no significant differences between
the two groups.

Discussion of Findings

The four hypotheses offered at the outset of this study
were not supported by the results of the analysis. These
findings do not agree with previous findings of other

33

studies such as Hunt (1981), Tortorich et al. (1981), Harper and Jordan (1982), Jenkins and Shimada (1983), and Steel et al. (1985). Limitations associated with the study's design made it difficult to sort out the precise reasons for a lack of visible QC-effects. Our inability to more thoroughly monitor this organization during the study afforded little opportunity to identify other factors which might have affected employee attitudes. Since the analysis suggested the possibility that other factors may have affected the attitudes of the employees, the results of this study concerning the efficacy of quality circles at this organization are inconclusive.

Another set of factors which may have limited the QC effects at this organization were program administrative factors. Alexander (1981) identified a set of requirements critical for a successful quality circle program. A key requirement was management support of the QC program. Atwater and Sander (1984), Mento et al. (1984), Novelli and Mohrman (1982), and Steel et al. (1985) cited a lack of management support as a cause for the lack of success of a quality circle program. If any of these requirements, especially management support, were neglected in the administration of the program in this organization, the results might well prove negative. In this study, the QC group did not show any significant difference over time on the item dealing with management support. There were also no significant differences between the QC group and the

comparison group on this item. About 50% of the QC group members responded that the quality circles received supervisory support only "sometimes". This result suggests that management may have provided weak support to the quality circle program at this organization. This may have been a primary reason for the lack of success of the quality circle intervention in producing more positive change in employee attitudes. Further study of this organization to determine the extent of management support for the QC program is needed to confirm these hypotheses.

Further evidence of a problem with the administration of the QC program at this organization is the QC group members' lack of satisfaction with the QC program. Table 5 shows that only 44.8% of the responses to the item on satisfaction with the quality circles were "satisfied" or "very satisfied". This lack of satisfaction with the quality circle program by the majority of the respondents may indicate that the program has some elements about it that are not pleasing to the circle members. Determining what is causing the dissatisfaction and correcting the problem could lead to a quality circle program that is more positive in its effects on employee attitudes.

Another factor that may impact the effectiveness of a quality circle program in positively influencing employee attitudes is the success that the QC has in identifying and providing solutions to problems. Steel et al. (1985) found that a quality circle program that was effective in

generating solutions to problems displayed positive effects on employee attitudes. They also found that a quality circle program that was not very effective in generating solutions to problems showed no significant change in employee attitudes. In this study, the actual effectiveness of the QC program was not evaluated in terms of suggestions made and suggestions implemented. The only measure of QC program effectiveness in this study was provided by an item dealing with the QC members' perception of whether the QC suggestions were implemented. Table 5 indicates that the members of the QC group believed that their solutions were being implemented. While this is not an accurate indicator of the effectiveness of the quality circles, it does indicate that employee attitudes towards the effectiveness and implementation of their solutions were positive. Further study of the effectiveness of the quality circles during the time period of this study could help determine if the reason for the negative results of this study were due to an ineffectiveness in problem solving.

The QC program's lack of success in improving employee attitudes at this organization may have been the result of the program's longevity. Griffin (1988) found that over a 3 year period, the effects of the quality circle program initially increased but then, after about 18 months, the level of effectiveness returned to its initial level. Unlike other studies, the quality circle program at this organization was not a new program when the pretest survey

36

was administered. It is possible that after the novelty of the program had worn off, circle members began to lose interest in the program. Griffin (1988) found that the decline in interest and enthusiasm was also evident on the part of management. Thus the apparent lack of support by management and the dissatisfaction of the QC members in this study may be a manifestation of the difficulties in institutionalizing quality circles. Evidently, as novelty effects diminish, replacement group members find fewer direct benefits from membership in QC groups. If this argument is sound, organizations planning on conducting quality circle programs must be aware of the potential decline in effectiveness of the circles over time and attempt to counteract this process. Feasible courses of action for a quality circle program that has reached this stage would be: disband the circle, attempt to increase the level of interest and enthusiasm (perhaps through a reward system), or modify the circle program to increase its responsibilities and level of authority over implementation of new ideas.

Limitations

A limitation of this study was the use of a nonequivalent control group design. The employees who participated in this quality circle program were volunteers rather than having been assigned to the circles in a random manner. At the beginning of the study, group composition

37

differences characterized the two criterion groups
presenting potential confounding problems.

Conclusion

The quality circles program at this organization did
not achieve the results predicted by the four hypotheses.
However, due to limitations in the way the study was
conducted, it was not possible to determine if any changes
or lack of changes in the employee's attitudes were the
direct result of the quality circle program or if some other
factors not related to quality circles affected the
results. Therefore, the results of this study are
inconclusive as to whether quality circles have a positive
effect on employee attitudes.

The analyses in this study suggest that problems may
exist in the administration of the quality circle program in
this organization. The majority of the QC group members
responded that they were not satisfied with the program.
There was also some indication that management did not
provide sufficient support for the program. While the
literature on quality circles indicates that employee
attitudes should improve, the improvement does not happen
automatically with the initiation of a quality circle. A
strong commitment by the management of the organization
towards the QC program appears to play an important role in
the efficacy of the program in improving employee
attitudes. Any organization contemplating starting a

quality circle program should not be lulled into thinking that once started, the program will take care of itself without ongoing support and commitment from management. Managers should realize that they must provide continuous support to the program if it is to be successful. Management must also be aware that the level of interest in the program may decline over time with a concomitant drop in the effectiveness of the circles, as well. Institutionalizing circles is difficult, but it is a necessity if lasting benefits are to be attained.

Recommendations for Further Research

Further research into the effects of quality circles on employee attitudes should be conducted in a setting in which confounding effects may be monitored and possibly controlled. Researchers should pay close attention to the potential for novelty effects from this intervention. Longitudinal research designs are essential. Additional focus should be on the level of management support provided to the quality circle program.

Appendix A: Background Information

This section of the survey contains several items dealing
with personal characteristics. This information will be
used to obtain a picture of the background of the "typical
employee."

1. Your age is:

    1. Less than 20

    2. 20 to 25

    3. 26 to 30

    4. 31 to 40

    5. 41 to 50

    6. 51 to 60

    7. More than 60

2. Your highest educational level obtained was:

    1. Non high school graduate

    2. High school graduate or GED

    3. Some college work

    4. Associate degree

    5. Bachelor's degree

    6. Some graduate work

    7. Master's degree

    8. Doctoral degree

3. Your sex is:

   1. Male

   2. Female

4. Length of time in this organization is:

   1. Less than 1 year

   2. 1-2 years

   3. 3-4 years

   4. 5-6 years

   5. 7-10 years

   6. 11-15 years

   7. 16-20 years

   8. More than 20 years

5. You are a (an):

   1. Officer

   2. Enlisted

   3. Civilian (GS)

   4. Civilian (WG)

   5. Non-appropriated Fund (NAF employee)

   6. Other

6. Your grade level is:

    1. 1-2

    2. 3-4

    3. 5-6

    4. 7-8

    5. 9-10

    6. 11-12

    7. 13-15

    8. Senior Executive Service

Appendix B: Employment Intentions

Use the rating scale given below to indicate your plans to either continue in Federal Government service or seek employment outside of the Federal Government.

17. Within the coming year, if I have my own way:

1 = I definitely intend to remain in Federal Service.

2 = I probably will remain in Federal Service.

3 = I have not decided whether I will remain in Federal Service.

4 = I probably will not remain in Federal Service.

5 = I definitely intend to leave Federal Service.

Appendix C: Participation In Decision Making

This section of the questionnaire contains a number of
statements that relate to feelings about your work group,
the demands of your job, and the supervision you receive.
Use the following rating scale to indicate the extent to
which you agree or disagree with the statements shown below.

        1 = Strongly disagree

        2 = Moderately disagree

        3 = Slightly disagree

        4 = Neither agree nor disagree

        5 = Slightly agree

        6 = Moderately agree

        7 = Strongly agree

18.   Within my work-group the people most affected by
      decisions frequently participate in making the
      decisions.

19.   In my work-group there is a great deal of opportunity
      to be involved in resolving problems which affect the
      group

20.   I am allowed to participate in decisions regarding my
      job.

21.   I am allowed a significant degree of influence in
      decisions regarding my work.

44

22. My supervisor usually asks for my opinions and
     thoughts in decisions affecting my work.

Appendix D: <u>Job Feedback</u>

Use the rating scale below to indicate how you feel about the following two questions.

    1 = Very little

    2 = Little

    3 = A moderate amount

    4 = Much

    5 = Very much

30. To what extent do you find out how well you are doing on the job as you are working?

31. To what extent do you receive information from your superior on your job performance.

    Use the same rating scale to indicate how much job feedback is present in your job.

32. The feedback from my supervisor on how well I am doing.

33. The opportunity to find out how well I am doing in my job.

34. The feeling that I know whether I am performing my job well or poorly.

Appendix E: Job Satisfaction

How satisfied are you in your present job? Use the
following rating scales to indicate your satisfaction.

1 - means you are very dissatisfied with this aspect
     of your job

2 - means you are dissatisfied with this
     aspect

3 - means you can't decide if you are satisfied or not
     with this aspect of your job

4 - means you are satisfied with this aspect

5 - means you are very satisfied with this aspect of
     your job

44. Being able to keep busy all the time (I)

45. The chance to work alone on the job (I)

46. The chance to do different things from time to
     time (I)

47. The chance to be "somebody" in the community (I)

48. The way my boss handles his or her people (E)

49. The competence of my supervisor in making decisions (E)

50. Being able to do things that didn't go against
     my conscience (I)

51. The way my job provides for steady employment (I)

52. The chance to do things for other people (I)

53. The chance to tell people what to do (I)

54. The chance to do something that makes use of my
    abilities (I)

55. The way company policies are put into practice (E)

56. My pay and the amount of work I do (E)

57. The chances for advancement on the job (E)

58. The freedom to use my own judgment (I)

59. The chance to try my own methods of doing the job (I)

62. The praise I get for doing a good job (E)

63. The feeling of accomplishment I got from the job (I)

Appendix F: Attitudes on Quality Circles

The following items deal with the Quality Circle program.
There are no right answers. The items attempt to gauge your
knowledge of and attitudes toward the Quality Circle program.

51. In general, Quality Circles have been effective
     in getting positive changes to be made.
     1 = Not ever effective
     2 = Rarely effective
     3 = Occasionally effective
     4 = Usually effective
     5 = Almost always effective

52. Quality Circles have received unfair preferential
     treatment from management?
     1 = Strongly disagree
     2 = Slightly disagree
     3 = Neither agree nor disagree
     4 = Slightly agree
     5 = Strongly agree

53. Management has supported the Quality Circle program.

    1 = Strongly disagree

    2 = Slightly disagree

    3 = Neither agree nor disagree

    4 = Slightly agree

    5 = Strongly agree

ANSWER THE FOLLOWING QUESTIONS ONLY IF YOUR WORK GROUP HAS A
QUALITY CIRCLE.

56. What is the extent of your personal involvement in the
    Quality Circle?

    1 = I was never a Quality Circle member.

    2 = I was but am no longer a member.

    3 = I am a member now.

57. To what degree has your own work benefitted from ideas
    and suggestions made by the Quality Circle in your
    work group?

    1 = Not at all

    2 = Occasionally

    3 = Don't know or can't decide

    4 = Some of the time

    5 = Very often

ANSWER THE REMAINING QUESTIONS ONLY IF YOU ARE OR WERE A
CIRCLE MEMBER.

58. How long have you been (or were) a Circle member?

    1 = Less than 1 month

    2 = 1 - 2 months

    3 = 3 - 6 months

    4 = 7 - 12 months

    5 = 13 - 18 months

    6 = 19 - 24 months

    7 = More than 2 years

59. Do the managers and supervisors in your organization
    support the Quality Circle process?

    1 = Not at all

    2 = Sometimes

    3 = Very much

    4 = I don't know

60. Have the suggestions for change developed by your
    Circle been implemented?

    1 = Never

    2 = Some of the time

    3 = Most of the time

    4 = All of the time

61. How effective was the Quality Circle in developing
    solutions to problems?

    1 = Not effective at all

    2 = Somewhat effective

    3 = Very effective

62. How satisfied are you with the Circle process in your
    organization?

    1 = Very dissatisfied

    2 = Dissatisfied

    3 = Can't decide

    4 = Satisfied

    5 = Very satisfied

References

Alexander, C. Philip. (1981). Learning from the Japanese. *Personnel Journal*, 60, 616-619.

Atwater, Leanne, & Sander, Stephen. (1984). *Quality circles in navy organizations: An evaluation*. (Technical Report No. NPRDC TR 8453). San Diego, CA: Navy Personnel Research and Development Center (AD-A146613).

Barra, Ralph. (1983). *Putting quality circles to work*. New York: McGraw-Hill Book Company.

Emory, C. William. (1985). *Business Research Methods* (3rd ed.). Homewood, IL: Irwin.

Fishbein, Martin, & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Griffin, Ricky W. (1988). Consequences of quality circles in an industrial setting: A longitudinal assessment. *Academy of Management Journal*, 2, 338-358.

Griffin, Ricky W. & Wayne, Sandy J. (1984). A field study of effective and less-effective quality circles. *Proceedings of the 44th Annual Meeting of the Academy of Management*, 44, 217-221.

Gryna, Frank M. Jr. (1981). *Quality Circles*. New York: AMACOM.

Harper, Stephen E. & Jordan, Gary L. (1982). *The utility of quality circles in U.S. manufacturing companies*. (Technical Report No. N00014-82-C0139). Alexandria, VA: Office of Naval Research (AD-A118949).

Hunt, Bonnie. (1981). Measuring results in a quality circles pilot test. *The Quality Circles Journal*, 4, 26-29.

Ingle, Sud. (1982). *Quality Circles Master Guide*. Englewood Cliffs, NJ: Prentice-Hall.

Jenkins, Kenneth M. & Shimada, Justin Y. (1983, August). Effects of quality control circles on worker performance: A field experiment. Paper presented at the National Meeting of the Academy of Management, New York.

Marks, Mitchell L., Mirvis, Philip H., Hackett, Edward J., & Grady, James F. Jr. (1986). Employee participation in a quality circle program: Impact on quality of work life, productivity, and absenteeism. Journal of Applied Psychology, 71, 61-69.

Mento, Anthony J., Steel, Robert P., Shane, Guy S., & Lloyd, Russell F. (1984). An examination of effects of the quality circles process on attitudinal variables in two department of defense installations. Transactions of the International Association of Quality Circles 6th Annual Conference and Exhibition, 6, 458-464.

Mobley, William H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover. Journal of Applied Psychology, 62, 237-240.

Novelli, Luke, Jr. & Mohrman, Susan A. (1982, August). Beyond testimonials: An evaluation study of a quality circle program. Paper presented at the Academy of Management Annual Meeting, New York.

Rafaeli, Anat. (1985). Quality circles and employee attitudes. Personnel Psychology, 38, 603-615.

Ross, Joel E. & Ross, William C. (1982). Japanese quality circles and productivity. Reston, VA: Reston Publishing Company.

Sims, Henry P., Szilagyi, Andrew D., & Keller, Robert T. (1976). The measurement of job characteristics. Academy of Management Journal, 19, 195-212.

Steel, Robert P. & Lloyd, Russell F. (in press). Cognitive, affective, and behavioral outcomes of participation in quality circles: conceptual and empirical findings. Journal of Applied Behavioral Science.

Steel, Robert P. & Mento, Anthony J. (1987). The participation-performance controversy reconsidered. Group & Organizational Studies, 12, 411-423.

Steel, Robert P., Mento, Anthony J., Dilla, Benjamin L., Ovalle, Nestor K. 2d, & Lloyd, Russell F. (1985). Factors influencing the success and failure of two quality circle programs. Journal of Management, 11, 99-119.

Steel, Robert P. & Ovalle, Nestor K. 2d. (1984). A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. Journal of Applied Psychology, 69, 673-686.

Steel, Robert P., Ovalle, Nestor K. 2d, & Lloyd, Russell F. (1982). Quality circles in the department of defense: Some preliminary findings. Proceedings of the 24th Annual Conference of the Military Testing Association, 24, 40-45.

Steel, Robert P. & Shane, Guy S. (1986). Evaluation research on quality circles: Technical and analytical implications. Human Relations, 39, 449-468.

Tortorich, R., Thompson, P., Orfan, C., Layfield, D., Dreyfus, C., & Kelly, M. (1981). Measuring organizational impact of quality circles. The Quality Circles Journal, 4, 24-34.

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. (1967). Manual for the Minnesota Satisfaction Questionnaire. Minnesota studies in vocational rehabilitation: XXII. Minneapolis, MN: University of Minnesota.
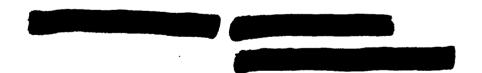
VITA

Major Lee L. Shaw ███████████████████████

███

enlisted in the United States Air Force on November 1971.

He attended the United States Air Force Academy and received

a Bachelor of Science in Computer Science on 1 June 1977.

He graduated from pilot training in 1978 and was assigned to

fly C-141s at Charleston Air Force Base, South Carolina.

While at Charleston AFB, he served as an instructor and as a

flight examiner. He was assigned to teach in the C-141

flight simulator at Charleston AFB. He then served as an

instructor pilot and flight examiner at Altus Air Force

Base, Oklahoma until entering the School of Systems and

Logistics, Air Force Institute of Technology, in June 1987.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
UNCLASSIFIED	

2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	Approved for public release; distribution unlimited.

4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
AFIT/GLM/LSR/88S-65	

6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
School of Systems and Logistics	AFIT/LSM	

6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
Air Force Institute of Technology Wright-Patterson AFB OH 45433-6583	

8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER

8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS			
	PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)

See Box 19

12. PERSONAL AUTHOR(S)

Lee L. Shaw, M.A., Maj, USAF

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
MS Thesis	FROM _____ TO _____	1988 September	67

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Quality Circles, Job Satisfaction, Retention, Job Feedback
05	08		

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Title: THE EFFECTS OF QUALITY CIRCLES ON EMPLOYEE ATTITUDES IN A DEPARTMENT OF DEFENSE ORGANIZATION

Thesis Chairman: Dr. Robert P. Steel
Associate Professor of Organizational Behavior and Management

Approved for public release IAW AFR 190-1.

WILLIAM A. MAUER   17 Oct 88
Associate Dean
School of Systems and Logistics
Air Force Institute of Technology (AU)
Wright-Patterson AFB OH 45433

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	UNCLASSIFIED

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Dr. Robert P. Steel	513-255-2254	AFIT/LSR

DD Form 1473, JUN 86   Previous editions are obsolete.

Quality circles are a form of participative decision making in which a group of employees identifies and provides solutions to problems in the organization. Imported from Japan in the early 1970s, quality circles are being used in increasing numbers. The Department of Defense has also used quality circles in some of its organizations.

Previous studies on quality circles have found that participation in the circles has a positive effect on employee attitudes. This study examined the effects of participation in quality circles on job satisfaction, retention, participation in decision making, and job feedback.

The data for this study were derived from two administrations of a quality of work life survey to a Department of Defense organization. The surveys were administered 18 months apart. A sample was derived that consisted of those respondents who had participated in both administrations of the surveys. This sample was then divided into two criterion groups, a comparison group and a QC group.

An analysis of the data did not support the hypotheses that participation in quality circles has a positive effect on employee attitudes. Limitations in the design of the study and a lack of management support were identified as possible causes. Another possible cause for the lack of success of the quality circle program in changing employee attitudes was that the novelty of the program may have already worn off by the time this study was begun. The people involved with the program may have lost interest in it.